Holter Hydroelectric Facility,
House No. 2
2000 feet west of Powerhouse
Wolf Creek vicinity
Lewis and Clark County
Montana

HAER No. MT-94-B

HAER
MONT
25-WOCRE
1B-

PHOTOGRAPHS
HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
Rocky Mountain Regional Office
National Park Service
P.O. Box 25287
Denver, Colorado 80225-0287

HAER
MONT
25-WOCRE.
1B-

HISTORIC AMERICAN ENGINEERING RECORD

HOLTER HYDROELECTRIC FACILITY, HOUSE NO. 2

HAER No. MT-94-B

I. INTRODUCTION

Location:	House No. 2 is located within the Holter Hydroelectric Facility Historic District, 2000 feet west of the Powerhouse. The facility is near the small community of Wolf Creek in Lewis and Clark County, Montana
Quad:	Sheep Creek
UTM:	Zone: 12; Easting 422950; Northing 5204450
Date of Construction:	c.1910
Present Owner:	The Montana Power Company 40 East Broadway Butte, Montana 59701
Present Use:	Vacant
Significance:	The Holter Hydroelectric Facility Historic District is significant as one of the most intact hydroelectric generating plants and operators' camps on the Missouri-Madison Project. House No. 2 contributes to the significance of the district as a vernacular adaptation of a construction camp building for permanent use in the operators' camp.
Historian:	Mary McCormick Renewable Technologies, Inc. Butte, Montana November 1995

II. HISTORY OF THE HOLTER HYDROELECTRIC FACILITY HISTORIC DISTRICT

A. INTRODUCTION

The Holter Hydroelectric Facility Historic District is a historic hydroelectric generating facility and associated construction and operators' camp situated on the Missouri River about 30 miles north of Helena, Montana (see figure 1). The Holter Hydroelectric Facility Historic District consists of a historic archaeological property (Unit A); the concrete dam and powerhouse and two switchyards (Unit B); and the operator's camp (Unit C). Within the noncontiguous units, the archaeological property, the dam and powerhouse, six dwellings, three garages, and a shed contribute to the district (see figure 2).

B. DAM AND POWERHOUSE CONSTRUCTION[1]

The United Missouri River Power Company (MRPC), headed by Samuel T. Hauser, envisioned a dam and powerhouse at Holter as early as 1906. At that time, work was underway at Hauser Dam, the company's second hydroelectric plant on the Missouri River. Its new plant at Holter would supply additional power to the recently consolidated Amalgamated Copper Company which owned the majority of the copper mines in Butte. MRPC planned to begin construction at Holter as soon as it received approval from the Secretary of War (as required by the General Dam Act 1906).[2]

With the collapse of the original Hauser Dam in 1908, MRPC began to experience serious financial difficulties. To ensure the delivery of power to its Butte customers, MRPC attempted to erect Holter Dam and rebuild Hauser Dam at the same time.[3] Engineers of the Capital City Improvement Company, formed to build the Holter Development for MRPC, designed a concrete dam and powerhouse at Holter[4] and signed a contract with Stone and Webster Engineering Corporation of Boston to build the facility. Part of the foundation for the concrete dam, including the apron and some energy baffles, were poured in 1909-1910.[5] The construction camp may have also been built at that time. However, cost overruns, sluggish progress, and diminishing investor support for MRPC plagued the Holter project. At the height of these misfortunes, MRPC lost its contracts with Amalgamated. As a direct result, Hauser lost control of the power company and its new executive committee abandoned the Holter project in late 1910.[6]

In 1911, MRPC was sold to the Butte Electric and Power Company[7], and in the following year The Montana Power Company was formed and absorbed the assets of the Butte company and its subsidiaries. Montana Power did not revive the Holter Development project for 3½ years, instead concentrating on renovations or new construction at Black Eagle, Ryan, Hauser, and Hebgen.[8]

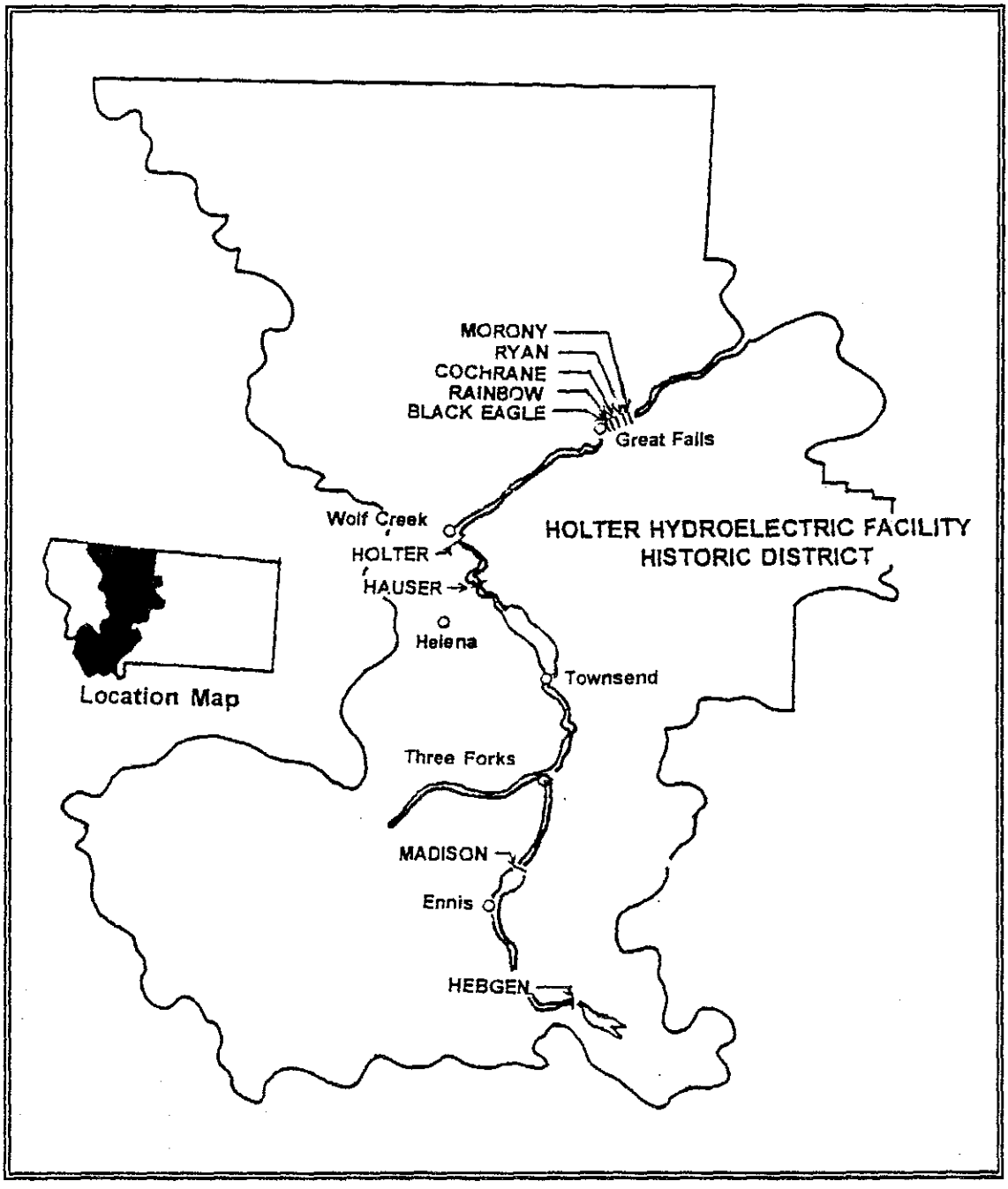
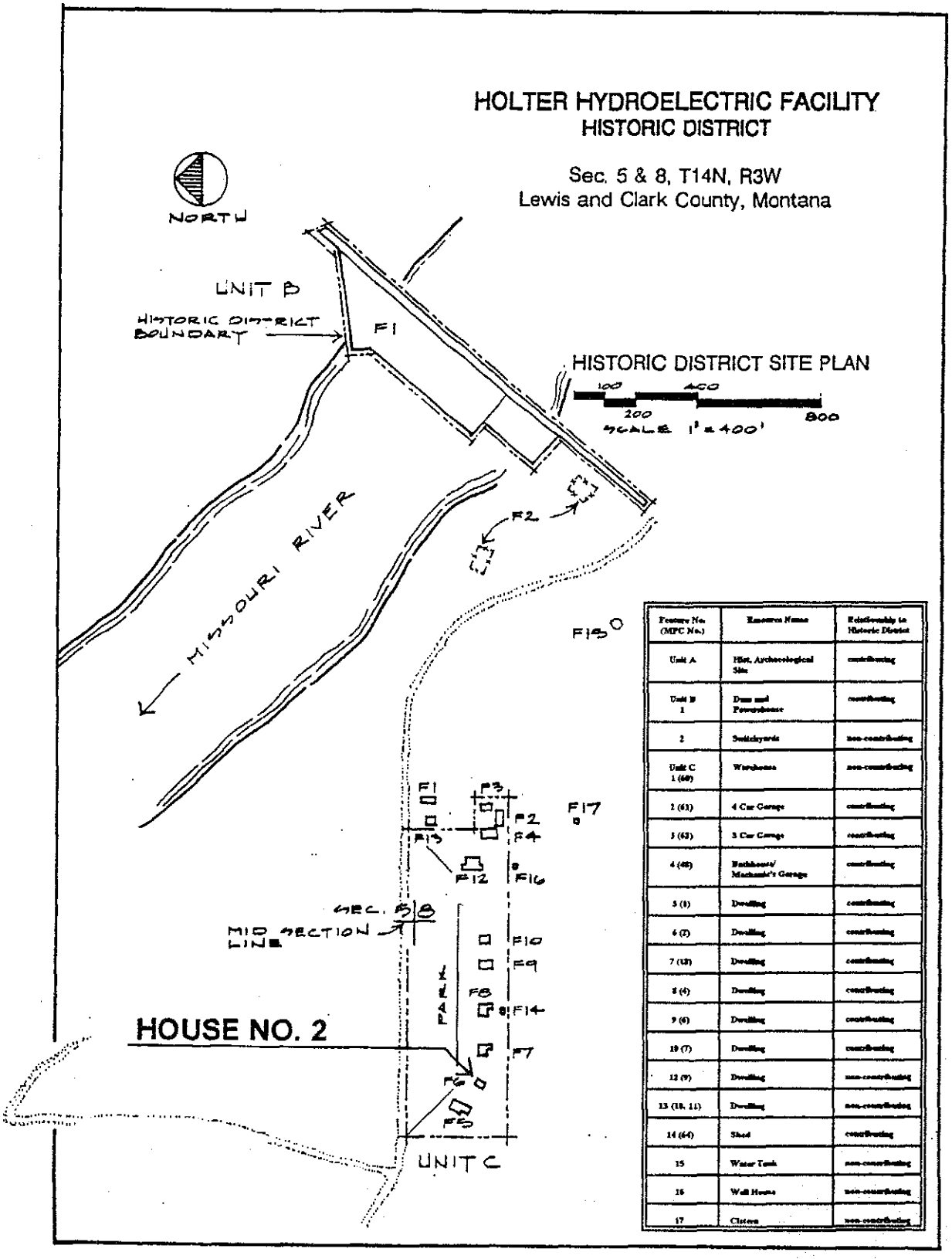


Figure 1: Holter Hydroelectric Facility Area Map



Feature No. (MPC No.)	Resource Name	Relationship to Historic District
Unit A	Hist. Archaeological Site	contributing
Unit B 1	Dam and Powerhouse	contributing
2	Switchyards	non-contributing
Unit C 1 (60)	Warehouse	non-contributing
2 (61)	4 Car Garage	contributing
3 (62)	3 Car Garage	contributing
4 (48)	Bathhouse/ Mechanic's Garage	contributing
5 (1)	Dwelling	contributing
6 (2)	Dwelling	contributing
7 (13)	Dwelling	contributing
8 (4)	Dwelling	contributing
9 (6)	Dwelling	contributing
10 (7)	Dwelling	contributing
12 (9)	Dwelling	non-contributing
13 (10, 11)	Dwelling	non-contributing
14 (64)	Shed	contributing
15	Water Tank	non-contributing
16	Well House	non-contributing
17	Cistern	non-contributing

Figure 2: Holter Hydroelectric Facility Historic District

Work at Holter resumed in March 1916. Montana Power hired the Western Office of Charles T. Main in Butte to design a hydroelectric facility which would incorporate as much of the 1909-1910 concrete work as possible.[9] Prepared by Henry A. Herrick, an engineer for Charles T. Main, the design of the dam resembled the 1908 Capital City Improvement Company design in several respects, including dam height, spillway shape, and integration of the powerhouse as part of the dam.[10] In contrast, however, Herrick specified vertical turbines and generators,[11] a redesigned shape and internal arrangement for the powerhouse, waste gates as part of the headwater control system, and some architectural changes to the downstream face of the dam.[12]

The Holter Development was put on-line specifically to supply power to the Butte, Anaconda & Pacific and Chicago, Milwaukee & St. Paul Railways[13] which had been electrified in 1913 and 1915, respectively. Power was fed into Montana Power's distribution network via connections to the Great Falls-Morel line and the East Helena switchyard. The Holter facility also contributed to Butte and Anaconda's power supply. Being closer to major supply points than the Great Falls plants, transmission loss on the system as a whole was reduced by using Holter power.[14]

C. CONSTRUCTION AND OPERATORS' CAMP

In general, erection of a construction camp was considered an integral component of the larger project of the power plant construction. It is likely, in fact, that construction of the camp was the first major physical act in the process of building the dam and powerplant. Although the various construction camps at developments on the Missouri-Madison Hydroelectric Project were constructed over a period of some four decades, they shared many characteristics of design, form, and materials. The Missouri-Madison Project camps generally featured a large boardinghouse and mess hall for unmarried workers, as well as a number of small, vernacular cottages for married employees. A variety of ancillary structures, including garages, storage sheds, and bath houses were also provided. The total number of buildings erected varied from camp to camp, depending on the needs of the site.[15]

Because of the relatively isolated location of Holter, the Stone and Webster Engineering Corporation, which reportedly employed 600 men during its 1909-10 construction work,[16] would have constructed a large camp on-site to house laborers and professionals. Documentation of the appearance of that camp, however, is limited to a site plan copied in early 1916 from an earlier Stone and Webster drawing.[17] The map shows approximately 100 construction camp buildings spread over a wide area. No photographic, written, or oral documentation has been found corroborating the actual existence of any or all of the buildings.

The construction camp at the Holter site during Montana Power's 1916-18 completion of the dam and powerhouse is more completely documented. Photographs of the camp from 1916 and 1917 shows that, in addition to those on the Stone and Webster drawing, Montana Power constructed several new buildings, including at least 13 dormitories.[18] The Holter construction camp was the largest Montana Power-owned camp, both in terms of area covered and numbers of buildings and tents used. Besides the more typical construction camp buildings, it included a photographic studio, a school, and a hospital. A sanitary sewer was also installed. The number of workers housed at the camp varied from 400 to 725 in different phases of the project.[19]

Construction camp buildings were never intended for long-term use, and as a result were built quickly and cheaply. Early Montana Power site maps describe many such buildings as having "plank" foundations, with walls constructed of "tar paper & boards." Photographs of the Holter construction camp support this description, revealing the camp as an aggregation of varying size buildings without permanent foundations and with roofs and walls covered with roofing paper. More comfortable accommodations were not really needed, since much of the camp became superfluous upon completion of the construction project. Although some construction camp buildings saw continued residential use during the early years of a facility's operation at other Montana Power dam locations, nearly all of these buildings had disappeared by the late 1920s.[20]

The Holter operators' camp is an exception to the general pattern of replacing construction camp buildings with newly-constructed, permanent housing. The six contributing houses within the Holter Hydroelectric Facility Historic District date from the construction period. Photographs and maps on file at Montana Power show that all six were present as early as 1916 (see figures 3 and 4). Other maps on file at Montana Power suggest that six of the seven houses originally at the camp may have been constructed during the 1908-1910 construction by Stone and Webster (see figures 3). However, there is no documentary evidence of the existence of the houses before 1916. Montana Power expenditure records from 1921 through 1923 list the construction of 10 "new cottages" for employees at Holter.[21] Of the ten houses shown on a 1944 map of Holter,[22] eight existed as part of the construction camp, and six of these remain as contributing buildings to the Holter Hydroelectric Facility Historic District. The 1921-23 expenditures cannot be explained except that they represent conversion of the temporary construction houses into permanent operator residences, by the addition of concrete foundations, siding, porches, and wood shingles.

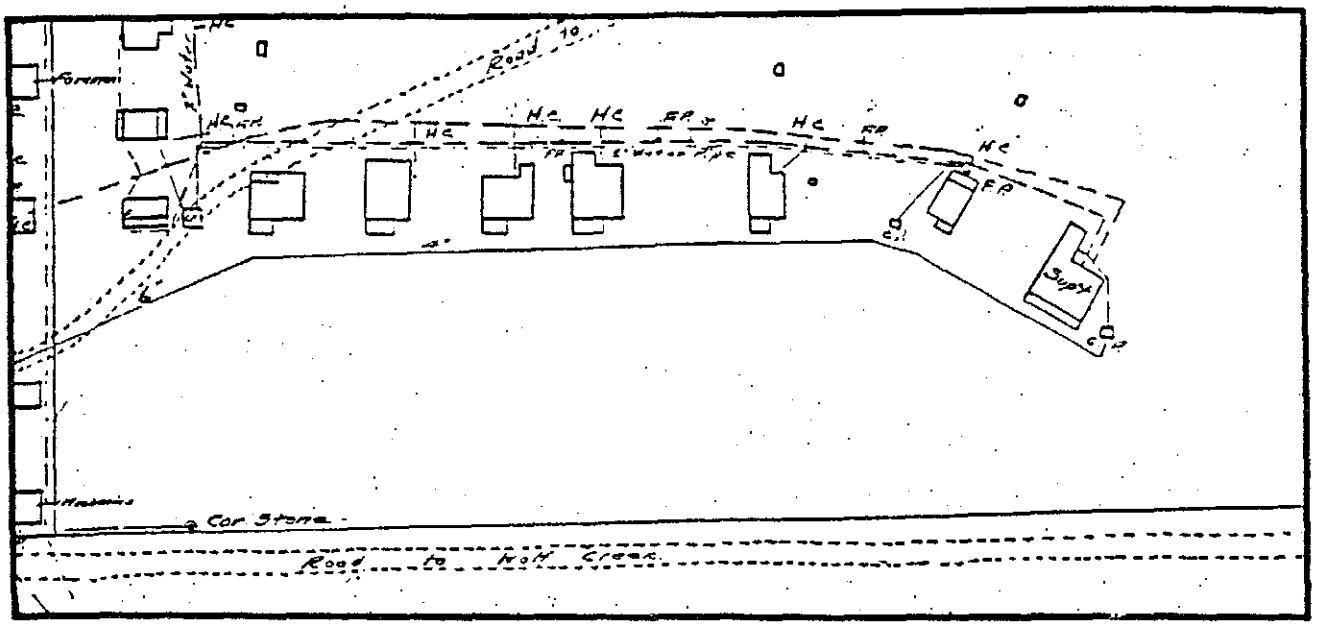


Figure 3: Portion of map reproduced on February 8, 1916 from Stone and Webster drawing. House No. 2 may have been evolved from the building on the left labeled "Engineers." (MPC Drawing #17304-E)

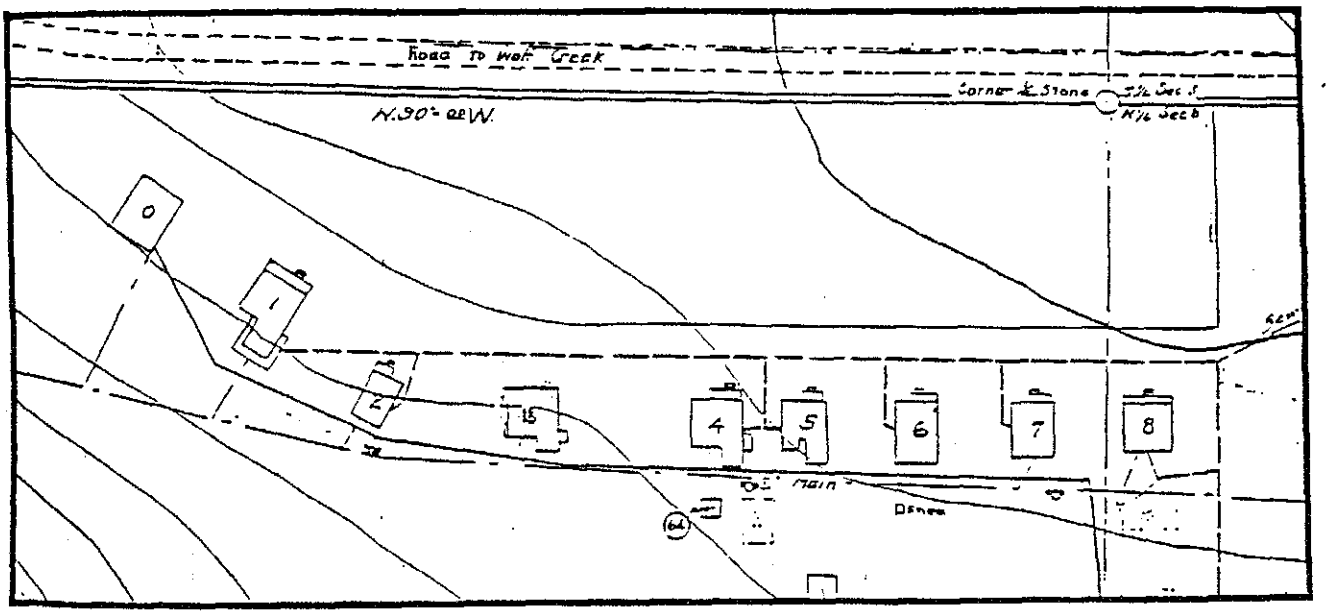


Figure 4: Portion of map showing the Holter Development on June 28, 1916. House No. 2 appears in its current form except for back porch. (MPC Drawing #43693-045)

D. HOUSE No. 2

House No. 2 at the Holter Hydroelectric Facility is a vernacular representation of the evolution of a temporary construction camp building into a permanent operators' camp house. House No. 2 was originally constructed as a rectangular wood-frame building with a front gable roof. The house was fronted by a small, open porch with a shed roof and likely had an enclosed wing or porch at the rear (see photograph MT-94-B-7, and figures 3 and 4). Like other buildings in the temporary construction camp, it had light-weight framing members and was set on wood piers. Earth was likely piled around the foundation to provide some protection from cold winter winds blowing beneath an otherwise raised building. The building's walls and roof were covered with roofing felt. The original intention of the construction company as to the disposal of House No. 2 after completion of the dam--whether it was to be demolished or retained for permanent occupation in the operators' camp--is unknown. The building's construction technologies and materials, however, suggest a temporary use.

Montana Power extensively remodeled House No. 2, when the Holter camp was presumably upgraded to a permanent facility in the early 1920s. The building was placed on a concrete foundation, the roof was shingled, and the walls were sided with drop siding. In addition, a one-story bedroom addition was added on the east and the open front porch was replaced by an enclosed shed-roof porch. A small rear porch was also likely added.

House No. 2 apparently received additional modifications in the late 1930s or early 1940s.[23] The original rear wing on the house and the 1920s rear porch probably were removed. In addition, a basement was excavated beneath the rear of the building and an enclosed porch added on the west side toward the rear. Since then, the house has been placed on a new concrete block foundation.

III. ARCHITECTURAL DESCRIPTION

House No. 2 is located in the Holter operators' camp. The camp consists of eight houses (two are non-contributing to the district), associated outbuildings, four plant and camp maintenance buildings, and a domestic water system. The six houses contributing to the historic district front a large park measuring 840 x 180 feet. The park has over 150 mature trees including willows, box elders, elms, locusts and others. Lawns also surround the houses. House No. 2 is the second house from the east end of the row.

House No. 2 is a one-story building with an irregular plan (see figure 5). The original rectangular block of the house measures 22'-4" x 34'-6". The bedroom addition on the east side is 14'-1" x 13'-7". The front porch measures 6'-11" x 15'-11", while the rear porch on the west is 7'-1" x 14'-1".

The original front-gabled roof is intersected below the ridge line by the gable roof on the east addition. The roof has a simple truss system composed of 2x4 rafters at 4-foot on center. The bottoms of the rafters are tied together with 1x6 ceiling joists. The roof is sheathed with rough 1-inch boards covered by interlocking asphalt shingles over a layer of wood shingles. The ridges are capped with galvanized ridge rolls with round finials at the ends. A 3-inch wide fascia board covers the ends of the slightly projecting rafter tails.

The walls of the house are constructed by 2x4s sheathed on the exterior by drop siding. The siding is fitted against 4½-inch corner boards. An 8-inch wide rake molding trims the wall juncture with the roof. A water table at the foundation is created by a slightly projecting and beveled drip above a 10-inch apron.

The front porch is enclosed by drop siding and bands of windows on all three walls. The windows are wood-sash fixed units with a thin vertical muntin dividing each into a one-over-one light configuration. The porch has a shed roof covered by interlocking asphalt shingles. A paneled wood, half-light door is positioned on the front wall of the porch. A concrete stoop and five steps provide between the porch and sidewalk. The interior of the porch has wainscoting on the walls and ceiling. The entrance to the house holds a hollow-core replacement door.

The rear porch is sided with drop siding and has a shed roof. A hollow-core door is located on the west wall. This entrance is fronted by a low, concrete stoop. The porch encloses a mud room and the head of the basement staircase.

The windows in the house are wood-sash double-hung units. Most are standard-sized units in a one-over-one configuration. Six-over-six windows, however, are located on the front wall of the house and the south wall of the rear porch (one each). In addition, small one-over-one double-hung units are located on the rear wall of the house, and include a single window and a set of paired windows. The window openings all have square-edge wood surrounds with a slightly projecting beveled drip at the hood.

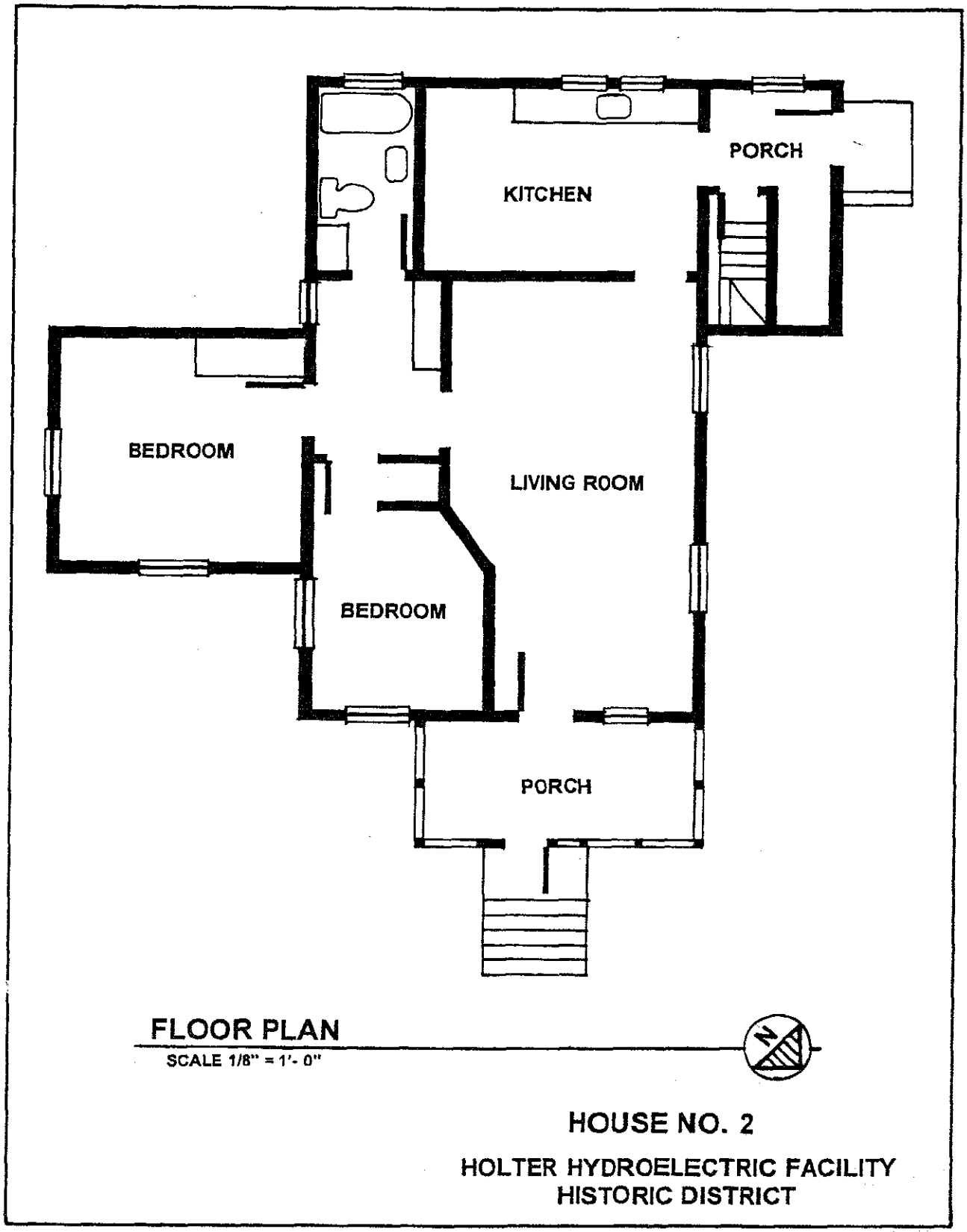


Figure 5. House No. 2 Floor Plan

The interior of the house has five rooms and a hall (see figure 5). The original portion of the house has been extensive remodeled and now has a living room and bedroom at the front and a kitchen and the bathroom at the rear. A hall is between the bedroom and bathroom. The addition holds a single bedroom. The walls are covered with sheet rock and have plain wood trim. The interior wall between the living room and bedroom is not original, and runs at an angle at one end. Floors in the house are 1x6 tongue-and-groove boards; they lie on a recently rebuilt sub-floor. The doors and other fixtures in the house are modern replacements. The basement of the house has a concrete floor, but otherwise is unfinished.

IV. FUTURE OF THE PROPERTY

The Montana Power Company plans to demolish House No. 2 at the Holter Hydroelectric Facility (FERC Project No. 2188). The Company has sponsored recording the building to the standards of the Historic American Engineering Record.

V. ENDNOTES

1. This section is taken from "Missouri-Madison Hydroelectric Project, FERC Project 2188: Cultural Resources Management," unpublished report prepared by Renewable Technologies, Inc. and Ethnoscience for The Montana Power Company, September 1991.

2. Alan S. Newell, "A Victim of Monopoly: Samuel T. Hauser and Hydroelectric Development on the Missouri River, 1898-1912" (M.A. Thesis, University of Montana, 1979), 59-61.

3. Ibid., 65-67, 98.

4. "The Capital City Power Plant of the United Missouri River Power Co.," Engineering News, 20 October 1910: 430-431.

5. Photograph of the Holter Dam Site, August 1916, in "Holter I," album on file at Hydro Engineering, The Montana Power Company, Butte..

6. Newell, "A Victim of Monopoly," 98-99, 114, 121-122.

7. Ibid., 128.

8. The Montana Power Company, "Story of Montana Power," (1941), 38, 64-71, unpublished report at The Montana Power Company, Butte.

9. Cecil Kirk, "History of Montana Power," II: 9: 25, unpublished report located at The Montana Power Company, Butte.

10. "The Capital City Power Plant," Engineering News, 430-431.

11. According to Duncan Hay (Hydroelectric Development in the United States, 1880-1940, Vol. 1, Washington, D.C.: Edison Electric Institute, 1991, pp. 71-72), between 1912 and 1915, the hydroelectric industry converted from the installation of horizontal turbines and generators to vertical ones. The widespread acceptance of the Kingsbury thrust bearing after abandonment of the original Holter project led to the switch to the new turbine mount design for the 1916-1918 construction.

12. The Montana Power Company, "Holter Development General Plan of Dam, Intake & Powerhouse," MPC Drawing No. 22354-C sheet 2, on file at Hydro Engineering, The Montana Power Company, Butte.

13. "Great Power Plant on Missouri River," Mineral County Independent, 7 October 1918.

14. Kirk, "History of Montana Power," II: 9: 27.

15. Renewable Technologies, Inc. and Ethnoscience, "Missouri-Madison Hydroelectric Project."

16. "Ninety-one Thousand Horse Power Development near Helena," Helena Independent, 29 May 1910: 9; "Rushing Work on Big Missouri River Dams," Helena Independent, 20 February 1910, 9.

17. The Montana Power Company, " General Plan of Holter Development, Reproduced from Stone & Webster Draw. No. R16100," MPC Drawing No. 17304-E, on file at Hydro Engineering, The Montana Power Company, Butte.

18. The Montana Power Company, photograph of the Holter Construction Camp, 1917, on file at the Holter Powerhouse, The Montana Power Company, Wolf Creek; photographs of the Holter Development, August 1916, in "Holter I," album.

19. Statement of Business Done by Great Falls Commercial Company at Holter, MT, years 1916-1917, n.d., in Phoenix Utility Company correspondence on Holter Dam, unnumbered file, miscellaneous box, Montana Power Company Predecessor Records, Montana Historical Society Archives, Helena; "Gigantic Enterprise Undertaken by Montana Power Company at the Holter Dam," Helena Independent, 13 August 1916, 1; "New Lake Twenty-Seven Miles Long, will Result when Holter Dam is Completed," Helena Independent, 7 October 1917, 1.

20. Renewable Technologies, Inc. and Ethnoscience, "Missouri-Madison Hydroelectric Project."

21. The Montana Power Company, "Index of Expenditure and Improvement Requisitions, Electric, For Years - 1913 to Date [1940," Box no. WH-200 5, at Record Services, The Montana Power Company, Butte.

22. The Montana Power Company, "Insurance Map of Holter Montana," revised to 1944, MPC Drawing No. 225568-D, on file at Hydro Engineering, The Montana Power Company, Butte.

23. The following modifications were not noted in a 1937 description of the house (see The Montana Power Company, "Reclassification of Electric Plant, Vol No. 1." 1 January 1937, on file at Property Accounting, The Montana Power Company, Butte) but except for the concrete block foundation, all likely occurred before the onset of World War II.

VI. BIBLIOGRAPHY

"The Capital City Power Plant of the United Missouri River Power Co." Engineering News. (20 October 1910).

"Gigantic Enterprise Undertaken by Montana Power Company at the Holter Dam." Helena Independent. 13 August 1916.

"Great Power Plant on Missouri River." Mineral County Independent. 7 October 1918.

Hay, Duncan. Hydroelectric Development in the United States, 1880-1940. Vol. 1. Washington, D.C.: Edison Electric Institute.

Kirk, Cecil. "History of Montana Power." Unpublished report held at The Montana Power Company, Butte.

Montana Historical Society. Archives. Statement of Business Done by Great Falls Commercial Company at Holter, Montana, years 1916-1917, n.d. Located in Phoenix Utility Company correspondence on Holter Dam, unnumbered file, miscellaneous box, Montana Power Company Predecessor Records.

The Montana Power Company. "General Plan of Holter Development, Reproduced from Stone & Webster Draw. No. R16100." Montana Power Company Drawing No. 17304-E. On file at Hydro Engineering, The Montana Power Company Butte.

____. "Holter Development General Plan of Dam, Intake & Powerhouse." MPC Drawing No. 22354-C sheet 2. On file at Hydro Engineering, The Montana Power Company Butte.

____. "Index of Expenditure and Improvement Requisitions, Electric, For Years - 1913 to Date [1940]. Box No. WH-200 5, Record Services, The Montana Power Company, Butte.

____. "Insurance Map of Holter, Montana." Revised to 1944. MPC Drawing No. 22568-D. On file at Hydro Engineering, The Montana Power Company, Butte.

____. Photograph of the Holter Development, August 1916. In "Holter I," album on file at Hydro Engineering, The Montana Power Company, Butte.

____. Photograph of the Holter Construction Camp, ca. 1916. On file at the Holter Powerhouse, The Montana Power Company, Wolf Creek.

____. "Reclassification of Electric Plant, Vol No. 1." 1 January 1937. On file at Property Accounting, The Montana Power Company, Butte.

____. "Story of Montana Power." (1941). Unpublished report on file at The Montana Power Company, Butte.

"New Lake Twenty-Seven Miles Long, will Result when Holter Dam is Completed." Helena Independent. 7 October 1917.

Newell, Alan S. "A Victims of Monopoly: Samuel T. Hauser and Hydroelectric Development on the Missouri River, 1898-1912." M.A. Thesis, University of Montana, 1979.

"Ninety-one Thousand Horse Power Development near Helena." Helena Independent. 29 May 1910.

"Rushing Work on Big Missouri River Dams." Helena Independent. 20 February 1910.

Renewable Technologies, Inc. and Ethnoscience. "Missouri-Madison Hydroelectric Project, FERC Project 2188: Cultural Resource Management." Unpublished report prepared for The Montana Power Company, September 1991.